

Length 12.25 ; width 8.00 ; aperture length 9.00 ; width 5.50 mill.

Length 11.25 ; width 7.75 ; aperture length 8.00 ; width 5.00 mill.

Length 9.75 ; width 7.00 ; aperture length 7.00 ; width 4.50 mill.

*Lymnæa randolphi* nov. sp.

Shell large, generally inflated, ovate ; whorls five to six, rounded, inflated, distinctly shouldered ; spire short, pyramidal ; the first 3-4 whorls are small and regularly wound, but the last whorl abruptly enlarges to more than four times the diameter of the preceding whorls, causing the spire whorls to appear as though set upon a pedestal ; sutures deeply impressed ; sculpture consisting of close-set, regular lines of growth crossed by fine, impressed, spiral lines ; the surface is malleated in many specimens and in some individuals there is a tendency to form raised spiral ridges on the body-whorl ; aperture very large, ovate, almost patulous, distinctly shouldered at the upper part ; columella without distinct plait, but covered by a heavy, erect callus which overhangs the umbilicus ; umbilicus deep, widely open ; color probably horny as in the majority of *Lymnæidæ*, but chalky white in the type specimens. Length 29.5, diam. 20, length of aperture 19. mm.

Habitat : Marsh Lake, near Dyea Valley, Alaska, collected by Mr. P. B. Randolph.

This is a very distinct species, not easily confounded with any other. It has a superficial resemblance to *Lymnæa mighelsi* Binney, but that species is imperforate or at most only very narrowly perforated. The shape of the spire, the rounded aperture and the open umbilicus will easily distinguish it.

*Lymnæa atkensis* Dall, is a narrow species with a long spire, a very narrowly open umbilicus and wholly lacks its peculiar shouldered whorls. The sculpture is more marked in *randolphi*.

Cotypes are in the Academy of Natural Sciences of Philadelphia and in the Chicago Academy of Sciences.

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A GLIMPSE AT THE SHELL FAUNA OF DELAWARE.

BY S. N. RHOADS.

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Literature is strangely silent as to the fauna of the State of Delaware. To remedy this in some degree, as well as to satisfy a long-

standing curiosity to compare the zoölogical features of the Bay State with those of New Jersey, my old tramping ground, I paid her five or six visits in different localities during the spring, summer and fall of 1903. While these expeditions were mainly ornithological, the Mollusca claimed more than passing attention, and a small collection of specimens was made and presented to the Academy of Natural Sciences of Philadelphia, where Prof. H. A. Pilsbry kindly made the identifications and comparisons here recorded.

Disclaiming any but a tyro's knowledge of conchology, it only remains for me to preface these records by stating my conviction that the evidence given by the *vertebrates* of Delaware indicate that her southernmost border is more strictly Lower Austral than Upper Austral. Certain species of birds and reptiles are found there which do not occur in southern New Jersey or Pennsylvania. In the Brandywine valley hills above Wilmington there is perhaps a shade of approach to a preponderating number of species typical of the Upper Austral and Lower Transition. In the upper Choptank valley the Lower Austral finds its most northerly reaching arm on the Atlantic seaboard, and the bird fauna there found in the thickly-forested bottoms is a curious combination of three distinct sub-faunæ, one northern, one western, and another southern. (R.)

In general character, the snail fauna is nearly identical with that of eastern Maryland west of the Chesapeake, but there are a few somewhat conspicuous differences, such as the occurrence of typical *Polygyra tridentata*, in place of *P. t. juxtidentis*, in Maryland. *Pyramidula alternata fergusonii* (Bld.) is another species of the coastal plain, which has not yet been found in Maryland or eastern Pennsylvania.

The *Unionidæ* offer unexpected interest by the finding of a colony of dwarf races of several species at Seaford, Sussex Co. (P.) Seaford is at the head of navigation on the Nanticoke River, an affluent of Chesapeake Bay, and lies near the centre of the level region reaching, with but slight elevation above high-tide level, across the entire peninsula. It is a sandy loam country with stretches of piney uplands and extensive areas of half-swamp lands. The left bank of the river is fifteen to twenty feet high in some places. Some scattered cypresses and white cedar occur on the left bank, but have nearly been exterminated. The botany and vertebrate zoölogy of the region are Lower Austral rather than Upper Austral in their prevailing

species, this being the dividing line between the two faunal regions. (R.)

In this locality the Uniones are normal in shape, but very much smaller than in other places in Delaware and the neighboring states.

Adult specimens of *Unio complanatus* measure 42 to 52 mm. long (the normal size being 70 to 95 mm. in other Delaware streams).

*U. fisherianus* is 40 to 43 mm. long, against 95 to 108 mm. at Choptank Mills.

*Lampsilis cariosus*, 40 to 44 mm. long.

*Lampsilis ochraceus*, 40 to 50 mm. long.

*Lampsilis radiatus*, 42 to 48 mm. long.

*Lampsilis nasutus*, 50 mm. long.

The whole *Unio* fauna is thus dwarfed, the shells being from about half to two-thirds the ordinary size. (P.)

It has occurred to me that the dwarfing of the Unionidæ of the Nanticoke may be due to the fact that no tributary of this sluggish river runs through a soil furnishing ingredients favorable to shell growth. The relative sluggishness of this whole river system may also have the degenerating effect of non-resistance. (R.)

In the following list a few Delaware shells collected by Mr. Witmer Stone are included, such records being duly credited :

*Polygyra tridentata* (Say). Brandywine Valley between Duponts and Rockland, Delaware.

*Polygyra albolabris* (Say). Brandywine Valley between Duponts and Rockland, and hills southwest side Brandywine near Paline, Delaware. (W. Stone!)

*Polygyra thyroides* (Say). Brandywine Valley between Duponts and Rockland; southwest of Brandywine Hills just below Penn. State line; and near Delaware City, Delaware. (W. Stone!)

*Polygyra hirsuta* (Say). Brandywine Valley between Duponts and Rockland, and near Delaware City, Delaware.

*Polygyra monodon fraterna* (Say). Brandywine Valley between Duponts and Rockland, Delaware.

*Strobilops labyrinthicus* (Say). Brandywine Valley between Duponts and Rockland; near Dover, Kent Co.; also near Delaware City.

*Bifidaria contracta* (Say). Near Delaware City, Delaware.

*Circinaria concava* (Say). Brandywine Valley between Duponts and Rockland, Delaware.

*Vitrea hammonis* (Strom). Choptank River, just below Choptank Mills (one mile east of Henderson, Maryland), Kent Co.

*Vitrea indentata* (Say). Choptank River, just below Choptank Mills (one mile east of Henderson, Maryland), Kent Co. Also Brandywine valley between Duponts and Rockland, and near Delaware City.

*Zonitoides arboreus* (Say). Choptank River, just below Choptank Mills, Kent Co.; Brandywine valley between Duponts and Rockland; Mt. Cuba and southwest side of Brandywine hills, just below Pennsylvania State line (W. Stone!), near Delaware City; near Dover, Kent Co., and Seaford, Sussex Co.

*Gastrodonta ligera* (Say). Brandywine valley between Duponts and Rockland.

*Gastrodonta suppressa* (Say). Brandywine valley between Duponts and Rockland. Southwest side Brandywine hills, just below Paline and Mt. Cuba (W. Stone!); also near Delaware City.

*Philomycus carolinensis* (Bosc.). Mt. Cuba (W. Stone!), Brandywine valley between Duponts and Rockland.

*Pyramidula alternata fergusonii* (Bld.). Brandywine valley between Duponts and Rockland.

*Lymnaea*<sup>1</sup> *humilis* (Say). Near Delaware City; between Dupont's Powder Mill and Rockland.

*Lymnaea desidiosa* (Say). Brandywine river between Duponts and Rockland.

*Lymnaea columella* (Say). Brandywine river between Duponts and Rockland; Seaford, Sussex Co.

*Planorbis bicarinatus* (Say). Brandywine river between Duponts and Rockland.

*Physa heterostropha* (Say). Brandywine river between Duponts and Rockland; Seaford, Sussex Co.; head of Red Clay creek, Christiana township.

*Goniobasis virginica* (Gmel.). Brandywine River between Dupont's Powder Mill and Rockland; also Seaford, Sussex Co., Delaware.

*Sphaerium* sp. Head of Red Clay Creek, Christiana Township, Delaware.

<sup>1</sup> The original orthography of this name is here restored. American authors have almost universally spelled it *Lymnaea*.—H. A. P.

*Lampsilis nasutus* (Say). Seaford, Sussex Co.; Choptank Mills, Kent Co., Delaware.

*Lampsilis radiatus* (Gmel.). Seaford, Sussex Co., Delaware.

*Lampsilis cariosus* (Say). Seaford, Sussex Co., Delaware.

*Lampsilis ochraceus* (Say). Seaford, Sussex Co., Delaware.

*Unio complanatus* ('Sol.' Dillw.). Seaford, Sussex Co.; Head of Red Clay Creek, Christiania Township; Choptank Mills, Kent Co.

*Unio fisherianus* Lea. Seaford, Sussex Co.; Choptank Mills, Kent Co., Delaware.

*Anodonta cataracta* Say. Mill-pond at head of Indian River, Millsboro, Sussex Co.; Choptank Mills, Kent Co., Delaware.

*Strophitus edentulus* (Say). Head of Red Clay Creek, Christiana Township, Delaware.

*Strophitus undulatus* (Say). Choptank Mills, Kent Co., Delaware. A single, well-developed specimen.

*Alasmodonta marginata varicosa* (Lam.). Head of Red Clay Creek, Christiana Township, Delaware.

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#### NOTES AND NEWS.

A PECULIAR HALIOTIS.—Not long ago a freak in the *Haliotis* line came under my observation, and thinking it of sufficient interest to the readers of THE NAUTILUS, I send the following description: The shell is, in most particulars, a characteristic *Haliotis cracherodii*, measuring  $4\frac{5}{8}$  inches in length,  $1\frac{5}{8}$  inches in height, and  $3\frac{1}{8}$  inches in width. It was obtained from a lot of shells brought from the coast of Lower California, by Frank Holzner, a local dealer in shells and curios, and unlike any other I have seen, has no holes whatever, and no scars or indentations to indicate even a good intention in that direction.—F. W. KELSEY.

NEW CAVE-SNAILS.—Dr. R. Sturany has been investigating an interesting collection of snails from caverns in Herzegovina (*Nbl. D. M. Ges.* for July-Sept., '04). Besides species of *Clamsilia* and *Pupa*, he describes a very small subcylindric land-snail with a round mouth and hairy cuticle as *Pholeoteras euthrix*. It is 2.5 to 3 mm. long, and has minutely latticed sculpture, beginning even upon the embryonic whorl. As only empty shells were found, and nothing